WE CLAIM:

1. A catalyst composition comprising the product produced by reacting in a polar organic solvent in the presence of ethylene:
   a) a simple divalent nickel salt having a solubility of at least 0.001 mole per liter in said polar organic solvent;
   b) a boron hydride reducing agent;
   c) a water soluble base;
   d) a ligand selected from the group consisting of o-dihydrocarbylphosphinobenzoic acids and alkali metal salts thereof; and
   e) a trivalent phosphite.
2. The catalyst composition of claim 1 in which the nickel salt comprises a nickel halide.
3. The catalyst composition of claim 1 in which the nickel salt comprises a nickel alkanoate.
4. The catalyst composition of claim 1 in which the boron hydride reducing agent is an alkali metal borohydride.
5. The catalyst composition of claim 1 in which the water soluble base is selected from the group consisting of potassium bicarbonate, potassium methoxide, potassium ethoxide, potassium isopropoxide, potassium hydroxide, potassium tert-butoxide, sodium bicarbonate, sodium methoxide, sodium ethoxide, sodium isopropoxide, sodium hydroxide and sodium tert-butoxide.
6. The catalyst composition of claim 1 in which the water soluble base is potassium hydroxide.
7. The catalyst composition of claim 1 in which the trivalent phosphite is an alkyl phosphite.
8. The catalyst composition of claim 1 in which the trivalent phosphite is triethyl phosphite.

9. The catalyst composition of claim 1 in which the ligand is selected from the group consisting of diarylphosphinobenzoic acids, arylcycloalkyl-phosphinobenzoic acids and the alkali metal salts thereof.

10. The catalyst composition of claim 1 in which the nickel salt comprises a nickel halide, the boron hydride reducing agent is an alkali metal borohydride, the water soluble base is a potassium hydroxide, the trivalent phosphite is triethyl phosphite and the ligand is o-dihydrocarbylphosphinobenzoic acid.

11. A process for preparing a catalyst composition which process comprises:

contacting in a polar organic solvent in the presence of ethylene:

a) a simple divalent nickel salt having a solubility of at least 0.001 mole per liter in said polar organic solvent;

b) a boron hydride reducing agent;

c) a water soluble base;

d) a ligand selected from the group consisting of o-dihydrocarbylphosphinobenzoic acids and alkali metal salts thereof; and

e) a trivalent phosphite.

12. The process of claim 11 in which the process is carried out at a temperature of between about 0° and about 200° C.

13. The process of claim 11 in which the nickel salt comprises a nickel halide.

14. The process of claim 11 in which the nickel salt comprises a nickel alkanoate.

15. The process of claim 11 in which in which the boron hydride reducing agent is an alkali metal borohydride.

16. The process of claim 11 in which the water soluble base is selected from the group consisting of potassium bicarbonate, potassium methoxide, potassium ethoxide, potassium isopropoxide, potassium hydroxide, potassium tert-butoxide, sodium bicarbonate, sodium methoxide, sodium ethoxide, sodium isopropoxide, sodium hydroxide and sodium tert-butoxide.

17. The process of claim 11 in which the water soluble base is potassium hydroxide.

18. The process of claim 11 in which the trivalent phosphite is an alkyl phosphite.

19. The process of claim 11 in which the trivalent phosphite is triethyl phosphite.

20. The process of claim 11 in which the ligand is selected from the group consisting of diarylphosphinobenzoic acids, arylcycloalkylphosphinobenzoic acids and the alkali metal salts thereof.

21. The process of claim 12 in which the nickel salt comprises a nickel halide, the boron hydride reducing agent is an alkali metal borohydride, the water soluble base is potassium hydroxide, the trivalent phosphite is triethyl phosphite and the ligand is o-dihydrocarbylphosphinobenzoic acid.

22. A process for the preparation of a mixture of olefinic products having high linearity comprising:

A) contacting ethylene in a polar organic solvent under conditions effective to produce linear, alpha-olefins in the presence of a catalyst produced by reacting components comprising:

a) a simple divalent nickel salt having a solubility of at least 0.001 mole per liter in said polar organic solvent;

b) a boron hydride reducing agent;

c) a water soluble base;

d) a ligand selected from the group consisting of o-dihydrocarbylphosphinobenzoic acids and alkali metal salts thereof; and,

e) a trivalent phosphite;

thereby producing a mixture of olefinic products having high linearity; and

B) recovering the olefinic products having high linearity.

23. The process of claim 22 in which the process is carried out at a temperature of between about 0° and about 200° C.

24. The process of claim 22 in which the nickel salt comprises a nickel halide.

25. The process of claim 22 in which the nickel salt comprises a nickel alkanoate.

26. The process of claim 22 in which the boron hydride reducing agent is an alkali metal borohydride.

27. The process of claim 22 in which the water soluble base is selected from the group consisting of potassium bicarbonate, potassium methoxide, potassium ethoxide, potassium isopropoxide, potassium hydroxide, potassium tert-butoxide, sodium bicarbonate, sodium methoxide, sodium ethoxide, sodium isopropoxide, sodium hydroxide and sodium tert-butoxide.

28. The process of claim 22 in which the water soluble base is potassium hydroxide.

29. The process of claim 22 in which the trivalent phosphite is an alkyl phosphite

30. The process of claim 22 in which the trivalent phosphite is triethyl phosphite.

31. The process of claim 22 in which the ligand is selected from the group consisting of diarylphosphinobenzoic acids,

arylcycloalkylphosphinobenzoic acids and the alkali metal salts thereof.

32. The process of claim 23 in which the nickel salt comprises a nickel halide, the boron hydride reducing agent is an alkali metal borohydride, the water soluble base is a potassium hydroxide, the trivalent phosphite is triethyl phosphite and the ligand is o-dihydrocarbylphosphinobenzoic acid.